Field Electric Heater Accessory for MVA Air Handling Unit

Installation, Operation and Maintenance Manual

How to Use this Manual:

This manual gives instructions regarding installation, operation and maintenance for the Field-installed Electric Heater Accessory for the MVA Series Air Handler.

Use these instructions in conjunction with other appropriate instructions, including but not limited to those instructions supplied with the air handler and outdoor unit. Installation must comply with all applicable local codes.

IMPORTANT! Refer to unit installation manual for general electrical installation and unit wiring diagrams and instructions.

GENERAL

Installation and maintenance are to be performed **only** by qualified personnel who are familiar with local codes and regulations and are experienced with HVAC equipment of this type.

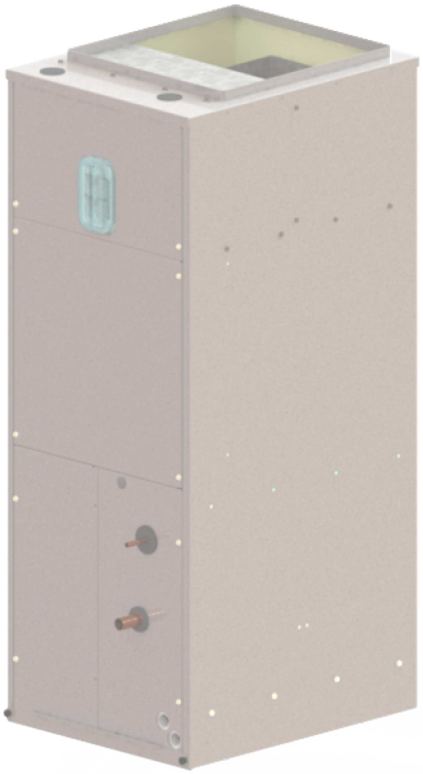
WARNING: Sharp edges, coil surfaces and rotating fans are a potential injury hazard – avoid contact.

WARNING: Hazardous voltage – Disconnect and Lock Out all incoming power sources before servicing or installing unit. ELECTRIC SHOCK CAN CAUSE DEATH.

WARNING: This equipment may be installed well above finished floor—Use extreme caution when working at heights.

SAFETY WARNING:

Installer should pay particular attention to the following words:
NOTE–intended to clarify or make installation easier.
CAUTION–given to prevent equipment damage.
WARNING–to alert installer that personal injury and/or equipment damage may result if installation procedure is not properly followed.



UNPACKING-CHECK FOR DAMAGE!

Immediately inspect each unit for damage upon receipt.

- Inspect units for external and concealed damage immediately.
- File any damage claims in accordance with the Freight Damage Policy and Terms and Conditions.
- Do not repair damaged units without written authorization.
- Protect stored units from damage.

DANGER

NEVER enter an enclosed fan cabinet or reach into a unit while the fan is running.
LOCK OPEN AND TAG the fan motor power disconnect switch before working on a fan. Take fuses with you and note removal on tag. Electric shock can cause personal injury or death.
LOCK OPEN AND TAG the electric heat coil power disconnect switch before working on or near heaters.
Failure to follow these warnings could lead to personal injury or death.

ELECTRIC HEATER ACCESSORY

DANGER

WARNING: Hazardous voltage. Only qualified personnel must install the electrical service. Disconnect and Lock Out all incoming power sources before connecting to electrical service.

WARNING: This appliance must be permanently grounded in accordance with the National Electrical Code and local code requirements.

WARNING: For use with copper conductors only.

CAUTION

Use only copper conductors for field-installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.

Make wiring connections in accordance with the system wiring system diagram and these instructions. Wrong wiring may cause improper operation or unit damage!

Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or malfunction that occurs as a result of such unauthorized changes.

Removal Procedure:

To remove electric heater,

1. Disconnect and lock out electrical power from the unit. Remove heater access panel. Disconnect power wires from the power switch—DANGER! - MAKE SURE there is no voltage on these wires before disconnecting!
2. Disconnect 2 harness connectors at the blower deck.
3. Remove 2 screws holding heater support feet to the blower deck.
4. Remove 4 screws that mount the heater to the heater bulkhead. Handle heater carefully to avoid damaging the wire heating elements. Remove heater from the unit.

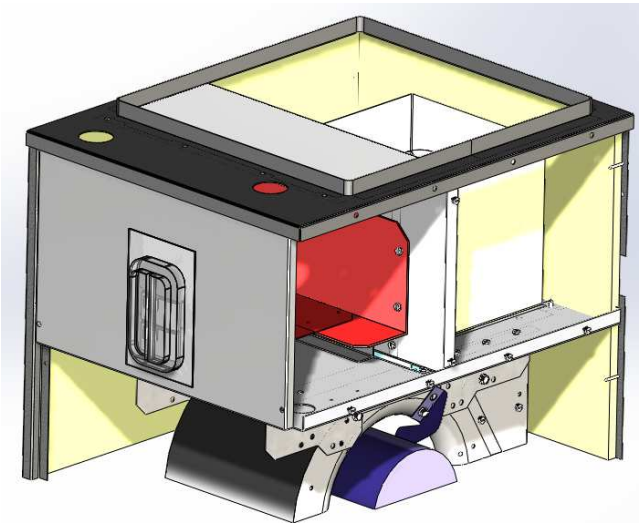


Fig. 1 — Heater Accessory Installed (right side panel not shown)

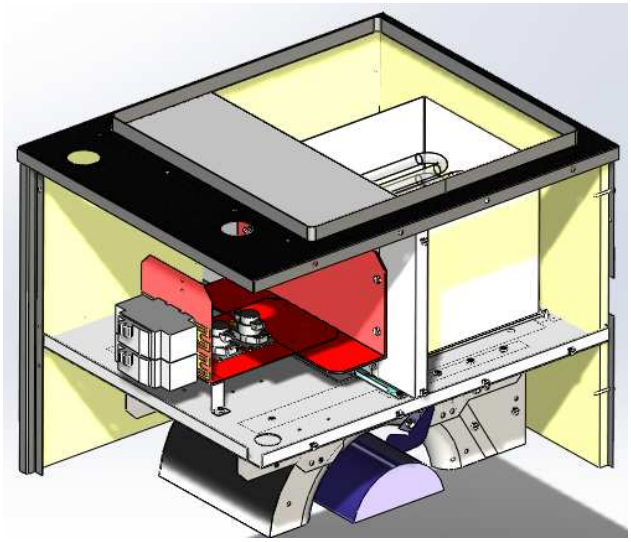


Fig. 2 — Heater Accessory Installed (right side and heater access panels not shown)

ELECTRIC HEATER ACCESSORY

Install Procedure:

To install the electric heater,

1. Disconnect and lock out electrical power from the unit. Remove heater access panel. Disconnect field power wires from the unit power wires. **DANGER! - MAKE SURE there is no voltage supply to the unit before proceeding!**
2. Disconnect and discard 1 harness connector at the blower deck.
3. Remove blank plate from heater access panel (covers square hole for breaker style power switches).
4. Remove SAT sensor and sensor holder from heater bulkhead and reposition on unit discharge ductwork routing through auxiliary SAT sensor hole on top panel.
5. Install SAT 3 feet after the first 90 degree turn in the discharge ductwork.
6. Remove plate on the heater bulkhead (4 screws).
7. Install heater by carefully supporting the heater and inserting it into the opening in the heater bulkhead. NOTE: Make sure to guide the pin into the hole at the back of the heater shroud. Secure the heater to the bulkhead with 4 screws.
8. Connect 2 wiring harnesses (male) to the matching female receptacles in the blower deck.

DANGER

WARNING: Hazardous voltage. Only qualified personnel must install the electrical service. Disconnect and Lock Out all incoming power sources before connecting to electrical service.

9. Connect field wiring to the breaker-style power switches on the front of the heater. **WARNING! Be sure to provide the appropriate wire size and branch circuit protection as required by the unit nameplate!**
10. Install the heater access panel.
11. Install the silicone cover "boot" over the top of the power switches. This protects them from dust buildup. The switches may be activated through the flexible boot material.
12. Mark the nameplate label with the matching heater kW rating. Label is located on the exterior of the front top panel.
13. Update EEPROM settings to values shown in the table. Refer to test run manual for detailed instructions for changing the EEPROM settings.

Item Code	New Settings
07	0001
38	0002
3C	-001

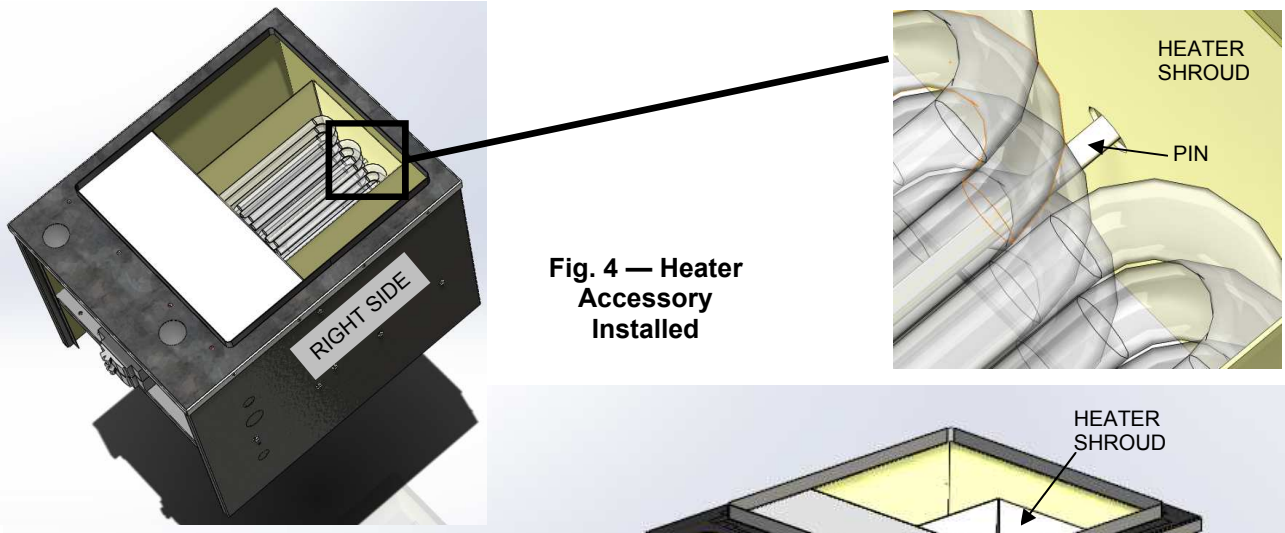


Fig. 4 — Heater Accessory Installed

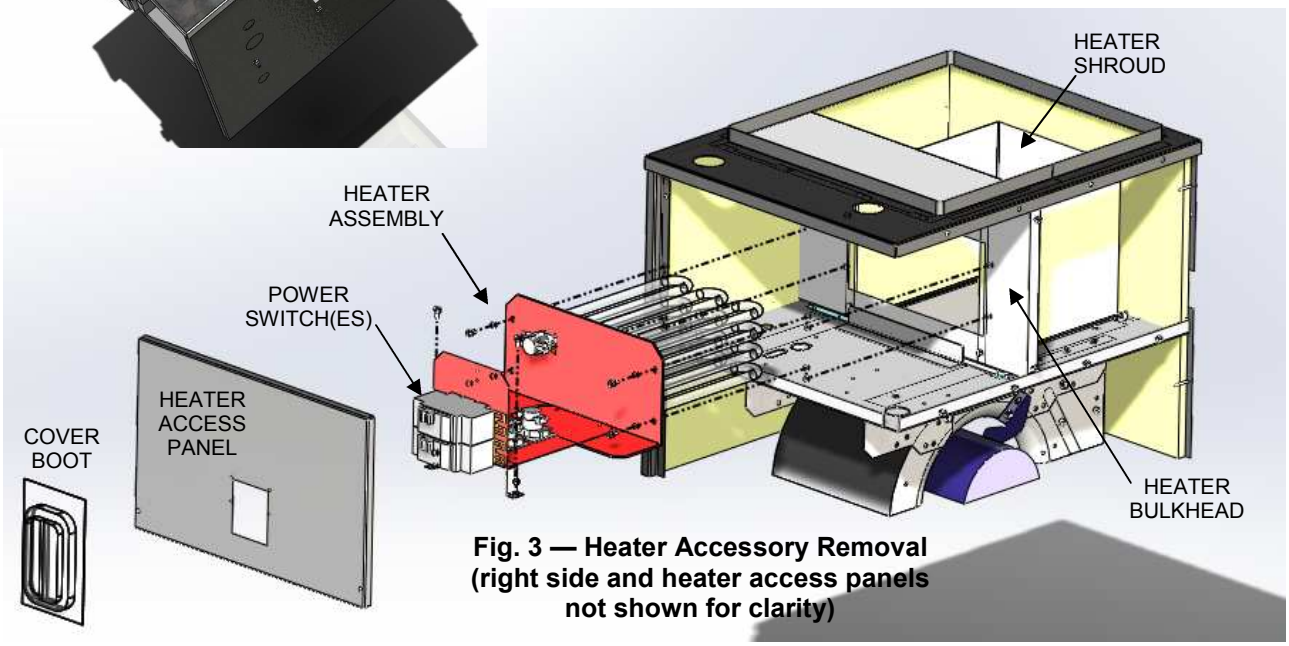


Fig. 3 — Heater Accessory Removal (right side and heater access panels not shown for clarity)

INSTALLATION-ELECTRICAL

DANGER

WARNING: Hazardous voltage. Only qualified personnel must install the electrical service. Disconnect and Lock Out all incoming power sources before connecting to electrical service.

WARNING: This appliance must be permanently grounded in accordance with the National Electrical Code and local code requirements.

WARNING: For use with copper conductors only.

Typical wiring diagrams are shown on the following pages FOR REFERENCE. Always refer to the wiring diagram on the air handling unit for actual wiring.

NOTE: CHECK MOTOR RATING PLATE FOR CORRECT LINE VOLTAGE.

Connect electrical service to unit. Refer to unit wiring diagram**.**

Power Wiring

For power supply connection, route field power wiring L1 and L2 and connect either:

1. Unit Without EH: to field-provided and installed disconnect switch and from switch to power entry (unit side) and to unit power leads inside the unit electrical section; or
2. Unit With EH: into the unit through power entry (unit side) and then to the factory installed power switch inside the electrical section (part of the heater accessory—see Figure 5). Note: power switch looks like a circuit breaker but **does not provide overload protection**. Power switch provided only with electric heater (field kit or factory installed). NOTE: When electric heat greater than 10kW is provided, two power supply circuits are required.

Refer to nameplate or Electrical Ratings (page 7) for FLA, maximum overcurrent protection device (MOPD) and minimum circuit ampacity (MCA). Also refer to wiring diagram affixed to unit to make control and power wiring connections. For new heater installation, mark the nameplate label with the matching heater kW rating. Label is located on the exterior of the front top panel.

NOTE: Installer is responsible for power wiring and branch circuit over current protection.

Control Voltage Wiring

Control voltage wiring may enter the unit at the control box located behind the blower access door, or other convenient location. Control voltage wiring leads exit the bottom of the control box and are ready for field-connection. **CAUTION!** To prevent malfunction of the air conditioner caused by electrical noise, route control wiring and inter-unit control wiring SEPARATELY FROM THE POWER WIRING!

DANGER

NEVER enter an enclosed fan cabinet or reach into a unit while the fan is running.
LOCK OPEN AND TAG the fan motor power disconnect switch before working on a fan. Take fuses with you and note removal on tag. Electric shock can cause personal injury or death.
LOCK OPEN AND TAG the electric heat coil power disconnect switch before working on or near heaters.
Failure to follow these warnings could lead to personal injury or death.

CAUTION

Use only copper conductors for field-installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

General

Provide strain relief where field wiring passes through cabinet. Wiring within the cabinet has been positively located and supported so that it does not pass over sharp metal edges or come in contact with moving parts. After servicing, position wiring properly in the original supports.

All field-installed wiring, including the electrical ground, MUST comply with the National Electrical Code (NEC) as well as applicable local codes. In addition, all field wiring must conform to the Class II temperature limitations described in the NEC.
Refer to factory wiring diagrams installed in the unit.

For communicating controls, refer to the condensing unit operation manual.

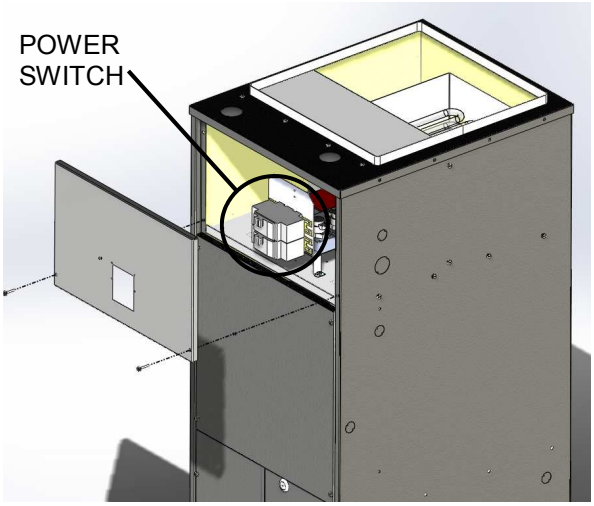
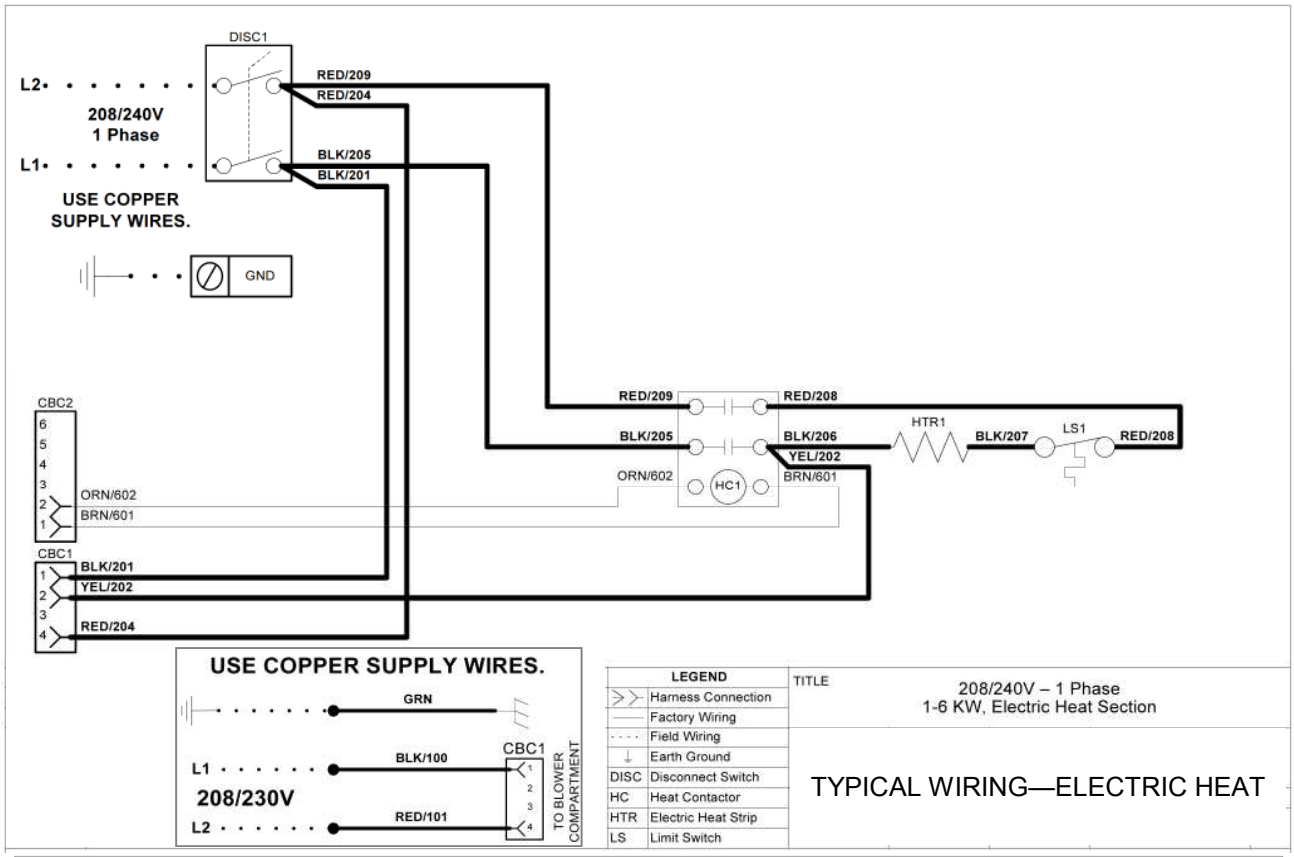
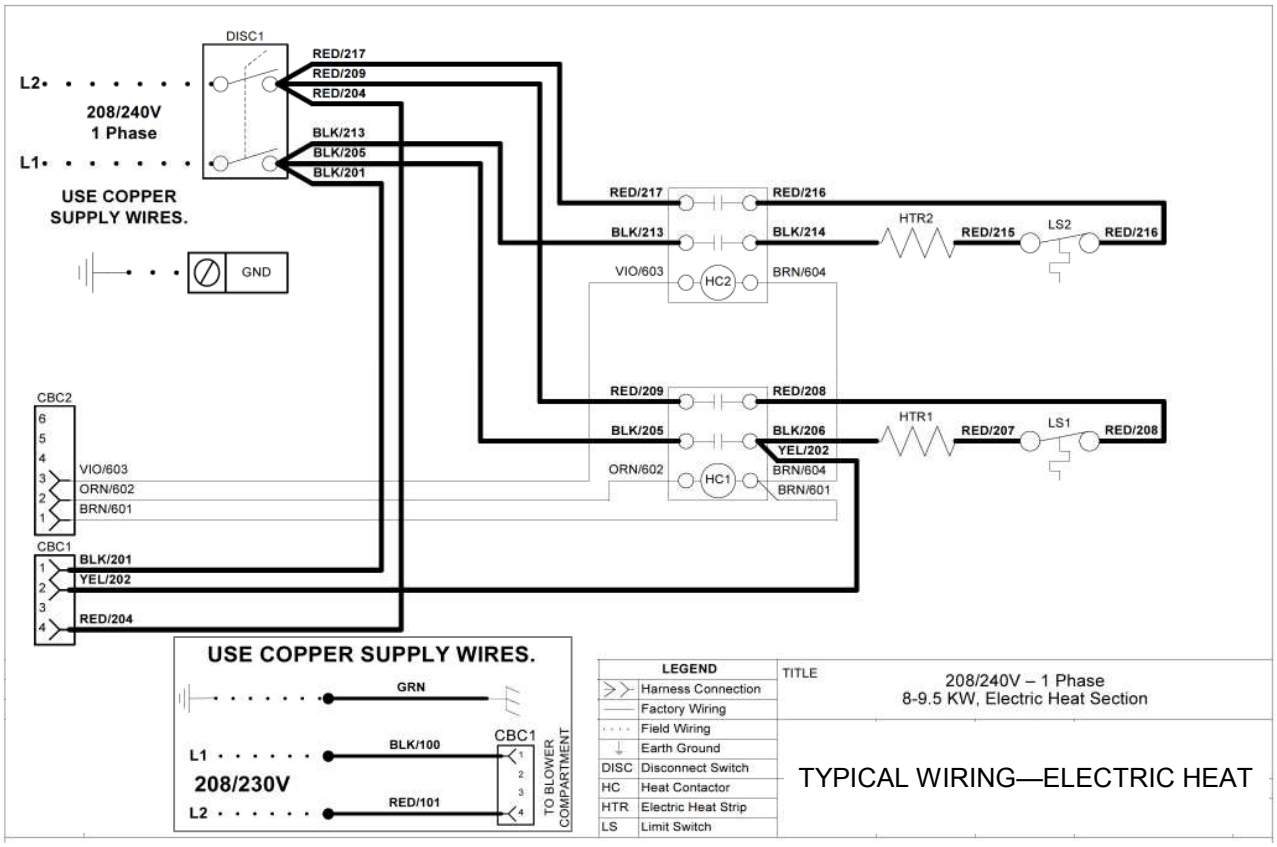


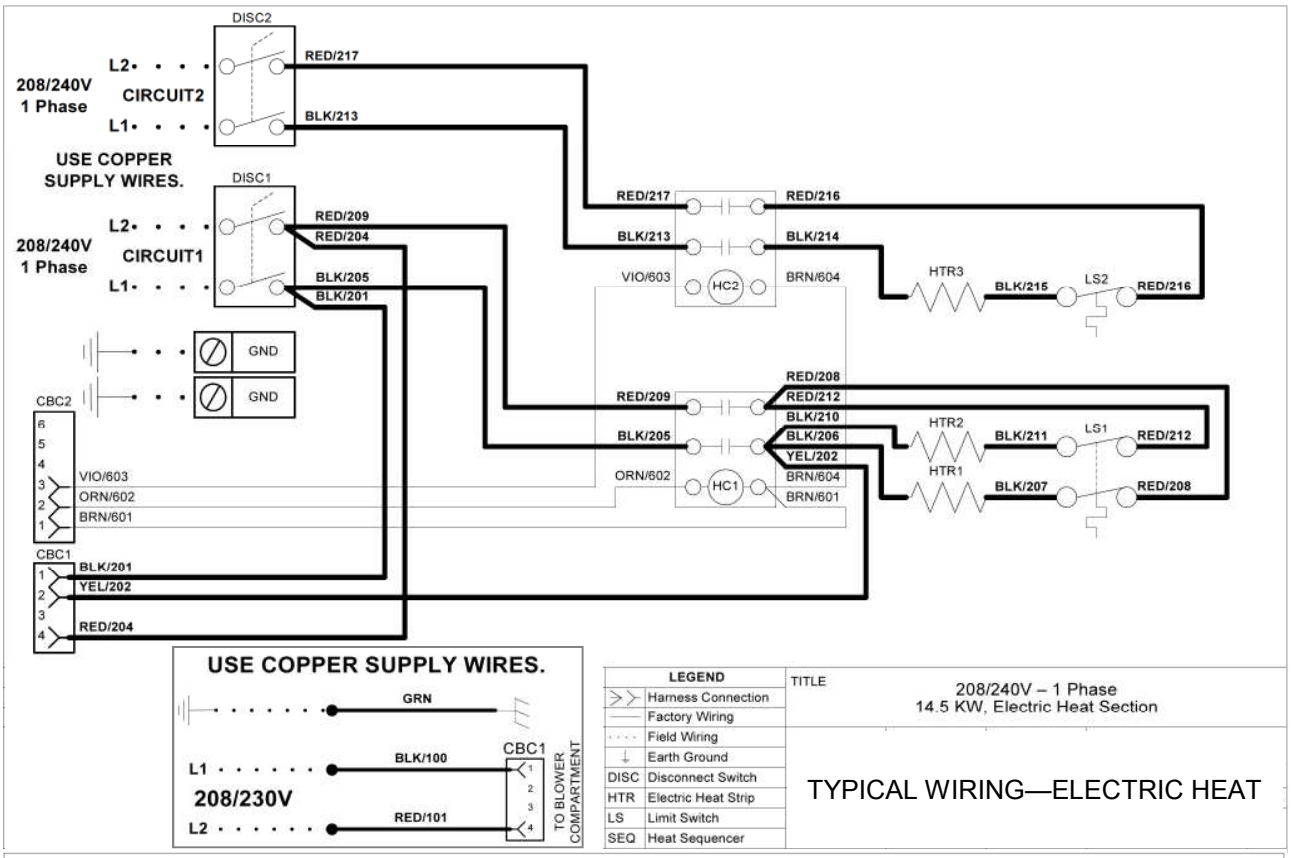
Figure 5
Unit with Electric Heat

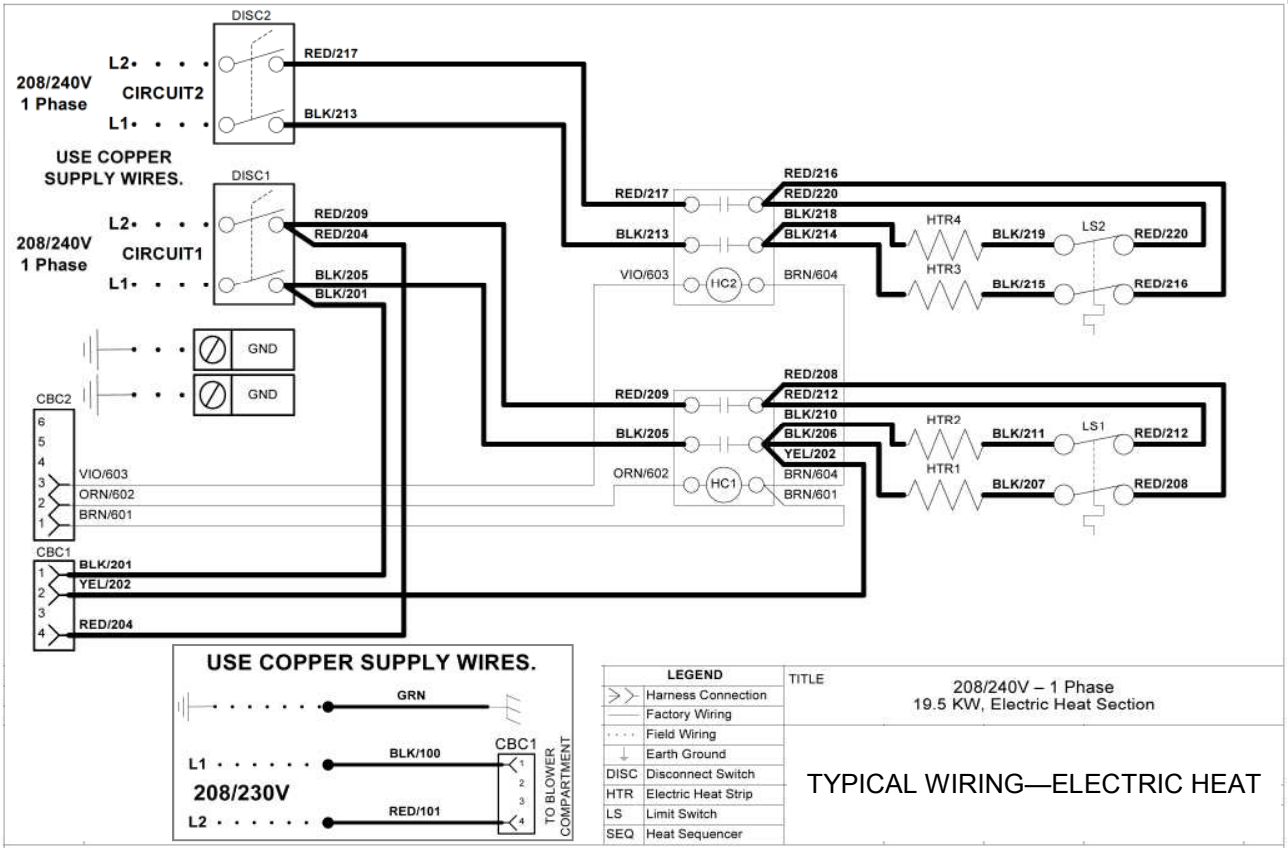
TYPICAL WIRING DIAGRAMS—
Electric Heat: 1-6kW and 8-9.5kW





TYPICAL WIRING DIAGRAMS—
Electric Heat: 14.5kW and 19.5kW





MVA Electrical Data

MVA Unit Size	MOTOR FLA 240-208V	TOTAL ELECTRIC HT (KW)		ELECTRIC HEAT AMPS				UNIT FLA				MINIMUM CIRCUIT AMPACITY				Maximum Overcurrent Protective Device (A)				MIN WIRE SIZE AWG*
				CIRCUIT 1		CIRCUIT 2		CIRCUIT 1		CIRCUIT 2		CIRCUIT 1		CIRCUIT 2		CIRCUIT 1		CIRCUIT 2		
		240	208	240	208	240	208	240	208	240	208	240	208	240	208	240	208	240	208	
18/24	3.0	NONE		NONE		NONE		3.0	3.0	n/a	n/a	3.8	3.8	n/a	n/a	15	15	n/a	n/a	14
		1.0	0.8	4.2	3.6	0.0	0.0	7.2	6.6	n/a	n/a	9.0	8.3	n/a	n/a	15	15	n/a	n/a	14
		3.0	2.3	12.5	10.8	0.0	0.0	15.5	13.8	n/a	n/a	19.4	17.3	n/a	n/a	20	20	n/a	n/a	12
		5.0	3.8	20.8	18.1	0.0	0.0	23.8	21.1	n/a	n/a	29.8	26.3	n/a	n/a	30	30	n/a	n/a	10
		6.0	4.5	25.0	21.7	0.0	0.0	28.0	24.7	n/a	n/a	35.0	30.8	n/a	n/a	35	35	n/a	n/a	8
		8.0	6.0	33.3	28.9	0.0	0.0	36.3	31.9	n/a	n/a	45.4	39.9	n/a	n/a	50	40	n/a	n/a	8
		9.5	7.1	39.6	34.3	0.0	0.0	42.6	37.3	n/a	n/a	53.2	46.6	n/a	n/a	60	50	n/a	n/a	6
30/36	3.6	NONE		NONE		NONE		3.6	3.6	n/a	n/a	4.5	4.5	n/a	n/a	15	15	n/a	n/a	14
		1.0	0.8	4.2	3.6	0.0	0.0	7.8	7.2	n/a	n/a	9.7	9.0	n/a	n/a	15	15	n/a	n/a	14
		3.0	2.3	12.5	10.8	0.0	0.0	16.1	14.4	n/a	n/a	20.1	18.0	n/a	n/a	25	20	n/a	n/a	10
		5.0	3.8	20.8	18.1	0.0	0.0	24.4	21.7	n/a	n/a	30.5	27.1	n/a	n/a	35	30	n/a	n/a	8
		6.0	4.5	25.0	21.7	0.0	0.0	28.6	25.3	n/a	n/a	35.8	31.6	n/a	n/a	40	35	n/a	n/a	8
		8.0	6.0	33.3	28.9	0.0	0.0	36.9	32.5	n/a	n/a	46.2	40.6	n/a	n/a	50	45	n/a	n/a	8
		9.5	7.1	39.6	34.3	0.0	0.0	43.2	37.9	n/a	n/a	54.0	47.4	n/a	n/a	60	50	n/a	n/a	6
		14.5	10.9	39.6	34.3	20.8	18.1	43.2	37.9	20.8	18.1	54.0	47.4	26.0	22.6	60	50	30	25	6
42	4.9	NONE		NONE		NONE		4.9	4.9	n/a	n/a	6.1	6.1	n/a	n/a	15	15	n/a	n/a	14
		1.0	0.8	4.2	3.6	0.0	0.0	9.1	8.5	n/a	n/a	11.3	10.6	n/a	n/a	15	15	n/a	n/a	14
		3.0	2.3	12.5	10.8	0.0	0.0	17.4	15.7	n/a	n/a	21.8	19.7	n/a	n/a	25	20	n/a	n/a	10
		5.0	3.8	20.8	18.1	0.0	0.0	25.7	23.0	n/a	n/a	32.2	28.7	n/a	n/a	35	30	n/a	n/a	10
		6.0	4.5	25.0	21.7	0.0	0.0	29.9	26.6	n/a	n/a	37.4	33.2	n/a	n/a	40	35	n/a	n/a	8
		8.0	6.0	33.3	28.9	0.0	0.0	38.2	33.8	n/a	n/a	47.8	42.2	n/a	n/a	50	45	n/a	n/a	8
		9.5	7.1	39.6	34.3	0.0	0.0	44.5	39.2	n/a	n/a	55.6	49.0	n/a	n/a	60	50	n/a	n/a	6
		14.5	10.9	39.6	34.3	20.8	18.1	44.5	39.2	20.8	18.1	55.6	49.0	26.0	22.6	60	50	30	25	6
		19.5	14.6	39.6	34.3	41.7	36.1	44.5	39.2	41.7	36.1	55.6	49.0	52.1	45.1	60	50	60	50	6
48	6.0	NONE		NONE		NONE		6.0	6.0	n/a	n/a	7.5	7.5	n/a	n/a	15	15	n/a	n/a	14
		1.0	0.8	4.2	3.6	0.0	0.0	10.2	9.6	n/a	n/a	12.7	12.0	n/a	n/a	15	15	n/a	n/a	14
		3.0	2.3	12.5	10.8	0.0	0.0	18.5	16.8	n/a	n/a	23.1	21.0	n/a	n/a	25	25	n/a	n/a	10
		5.0	3.8	20.8	18.1	0.0	0.0	26.8	24.1	n/a	n/a	33.5	30.1	n/a	n/a	35	35	n/a	n/a	10
		6.0	4.5	25.0	21.7	0.0	0.0	31.0	27.7	n/a	n/a	38.8	34.6	n/a	n/a	40	35	n/a	n/a	8
		8.0	6.0	33.3	28.9	0.0	0.0	39.3	34.9	n/a	n/a	49.2	43.6	n/a	n/a	50	45	n/a	n/a	8
		9.5	7.1	39.6	34.3	0.0	0.0	45.6	40.3	n/a	n/a	57.0	50.4	n/a	n/a	60	60	n/a	n/a	6
		14.5	10.9	39.6	34.3	20.8	18.1	45.6	40.3	20.8	18.1	57.0	50.4	26.0	22.6	60	60	30	25	6
		19.5	14.6	39.6	34.3	41.7	36.1	45.6	40.3	41.7	36.1	57.0	50.4	52.1	45.1	60	60	60	50	6
60	7.6	NONE		NONE		NONE		7.6	7.6	n/a	n/a	9.5	9.5	n/a	n/a	15	15	n/a	n/a	14
		1.0	0.8	4.2	3.6	0.0	0.0	11.8	11.2	n/a	n/a	14.7	14.0	n/a	n/a	15	15	n/a	n/a	14
		3.0	2.3	12.5	10.8	0.0	0.0	20.1	18.4	n/a	n/a	25.1	23.0	n/a	n/a	30	25	n/a	n/a	10
		5.0	3.8	20.8	18.1	0.0	0.0	28.4	25.7	n/a	n/a	35.5	32.1	n/a	n/a	40	35	n/a	n/a	8
		6.0	4.5	25.0	21.7	0.0	0.0	32.6	29.3	n/a	n/a	40.8	36.6	n/a	n/a	45	40	n/a	n/a	8
		8.0	6.0	33.3	28.9	0.0	0.0	40.9	36.5	n/a	n/a	51.2	45.6	n/a	n/a	60	50	n/a	n/a	6
		9.5	7.1	39.6	34.3	0.0	0.0	47.2	41.9	n/a	n/a	59.0	52.4	n/a	n/a	60	60	n/a	n/a	6
		14.5	10.9	39.6	34.3	20.8	18.1	47.2	41.9	20.8	18.1	59.0	52.4	26.0	22.6	60	60	30	25	6
		19.5	14.6	39.6	34.3	41.7	36.1	47.2	41.9	41.7	36.1	59.0	52.4	52.1	45.1	60	60	60	50	6

Notes:

*1. Minimum Wire Gauge is based upon Circuit 1 ampacity and the use of 75C wire at the unit.

2. 14.5kW and 19.5kW Heating units require two supply circuits.

3. MVA18/24 use ECM 5.0 motor. MVA30/36/42/48/60 use ECM-VE motor.

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